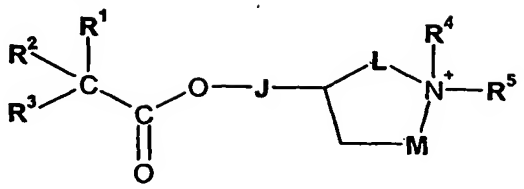
CLAIMS

1. A compound of formula I



I

in salt or zwitterionic form wherein

R^1 and R^3 are each independently a C_3-C_{15}-carbocyclic group or a 5- to 12-membered heterocyclic group having at least one ring heteroatom selected from nitrogen, oxygen and sulphur;

R^2 is hydrogen, hydroxy, or C_1-C_4-alkyl optionally substituted by hydroxy;

L and M are (a bond and -CH_2-CH_2-), (-CH_2- and -CH_2-CH_2-) or (-CH_2-CH_2- and -CH_2-) respectively and J is C_1-C_2-alkylene,

or L and M are (-CH_2- and -CH_2-CH_2-) or (-CH_2-CH_2- and -CH_2-) respectively and J is a bond;

R^4 is C_1-C_4-alkyl;

R^5 is C_1-alkyl substituted by -SO-R^6, -S(=O)$_2$-R^6, -CO-R^6, -CO-O-R^6, -CO-NH-R^6 or -R^7,

or R^5 is C_2-C_{10}-alkyl substituted by -O-R^6, -S-R^6, -SO-R^6, -S(=O)$_2$-R^6, -CO-R^6, -O-CO-R^6, -CO-O-R^6, -NH-CO-R^6, -CO-NH-R^6, -R^7 or -R^8,

or R^5 is C_2-C_{10}-alkenyl or C_2-C_{10}-alkynyl optionally substituted by -R^7 or -R^8;

R^6 is a C_3-C_{15}-carbocyclic group or a 5- to 12-membered heterocyclic group having at least one ring heteroatom selected from nitrogen, oxygen and sulphur,

or R^6 is C_1-C_{10}-alkyl optionally substituted by C_1-C_{10}-alkoxy, -O-R^7, a C_3-C_{15}-carbocyclic group or a 5- to 12-membered heterocyclic group having at least one ring heteroatom selected from nitrogen, oxygen and sulphur;

R^7 is a 5- to 12-membered heterocyclic group having at least one ring heteroatom selected from nitrogen, oxygen and sulphur; and

R^8 is a C_3-C_{15}-carbocyclic group.

2. A compound according to claim 1, wherein

R^1 and R^3 are each independently a C_3-C_{15}-carbocyclic group or a 5- to 12-membered heterocyclic group having at least one ring heteroatom selected from nitrogen, oxygen and sulphur;

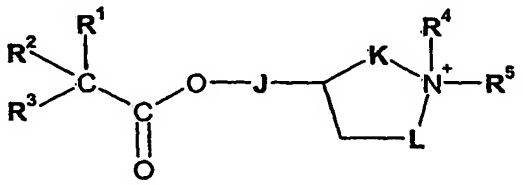
R^2 is hydroxy;

L and M are (a bond and -CH_2-CH_2-), (-CH_2- and -CH_2-CH_2-) or (-CH_2-CH_2- and -CH_2-) respectively and J is C_1-C_2-alkylene,

or L and M are (-CH_2- and -CH_2-CH_2-) or (-CH_2-CH_2- and -CH_2-) respectively and J is a bond;
R^4 is C_1-C_4-alkyl;
R^5 is C_1-alkyl substituted by -CO-R^6 or -CO-NH-R^6,
or R^5 is C_2-C_{10}-alkyl substituted by -O-R^6, -S-R^6, -O-CO-R^6 or -R^8,
or R^5 is C_2-C_{10}-alkenyl or C_2-C_{10}-alkynyl optionally substituted by -R^8;
R^6 is a C_3-C_{15}-carbocyclic group,
or R^6 is C_1-C_{10}-alkyl optionally substituted by C_1-C_{10}-alkoxy, O-R^8 or a C_3-C_{15}-carbocyclic group; and
R^8 is a C_3-C_{15}-carbocyclic group.

3. A compound according to claim 2, wherein
R^1 and R^3 are each independently a C_3-C_{10}-carbocyclic group, preferably phenyl, or a 5- to 9-membered heterocyclic group having at least one ring heteroatom selected from nitrogen, oxygen and sulphur, preferably thienyl;
R^2 is hydroxy;
L and M are (a bond and -CH_2-CH_2-), (-CH_2- and -CH_2-CH_2-) or (-CH_2-CH_2- and -CH_2-) respectively and J is C_1-C_2-alkylene,
or L and M are (-CH_2- and -CH_2-CH_2-) or (-CH_2-CH_2- and -CH_2-) respectively and J is a bond;
R^4 is C_1-C_4-alkyl;
R^5 is C_1-alkyl substituted by -CO-R^6 or -CO-NH-R^6,
or R^5 is C_2-C_5-alkyl substituted by -O-R^6, -S-R^6, -O-CO-R^6 or -R^8,
or R^5 is C_2-C_4-alkenyl or C_2-C_8-alkynyl optionally substituted by -R^8;
R^6 is a C_3-C_{10}-carbocyclic group, preferably phenyl,
or R^6 is C_1-C_{15}-alkyl optionally substituted by C_1-C_4-alkoxy, O-R^8 or a C_3-C_{10}-carbocyclic group; and
R^8 is a C_3-C_{10}-carbocyclic group, preferably phenyl.

4. A compound according to claim 1, that is also a compound of formula Ia



Ia

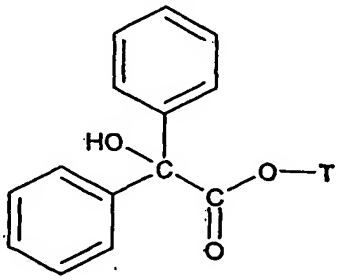
wherein
R^1 and R^3 are each independently a C_3-C_{15}-carbocyclic group or a 5- to 12-membered heterocyclic group having at least one ring heteroatom selected from nitrogen, oxygen and sulphur;

R^2 is hydrogen, hydroxy, or C_1-C_4-alkyl optionally substituted by hydroxy;
J and K are both independently C_1-C_2-alkylene,
or one of J and K is a bond and the other is C_1-C_2-alkylene;
L is C_1-C_2-alkylene;
R^4 is C_1-C_4-alkyl;
R^5 is C_1-C_8-alkyl substituted by $-OR^6$, -O-CO-R^6 or -CO-O-R^6; and
R^6 is C_1-C_8-alkyl, a C_3-C_{15}-carbocyclic group or a 5- to 12-membered heterocyclic group having at least one ring heteroatom selected from nitrogen, oxygen and sulphur.

5. A compound according to claim 4, wherein
R^1 and R^3 are each independently a C_3-C_{15}-carbocyclic group;
R^2 is hydroxy;
J is a bond;
K is C_1-C_2-alkylene;
L is C_1-C_2-alkylene;
R^4 is C_1-C_4-alkyl;
R^5 is C_1-C_8-alkyl substituted by -OR^6; and
R^6 is a C_3-C_{15}-carbocyclic group.

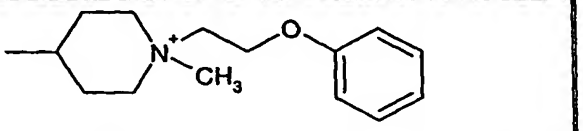
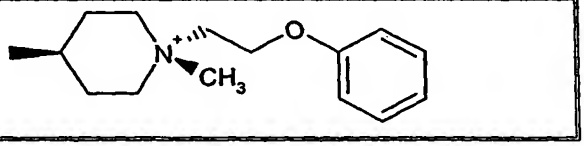
6. A compound according to claim 5, wherein
R^1 and R^3 are each independently a C_3-C_{10}-carbocyclic group, preferably phenyl;
R^2 is hydroxy;
J is a bond;
K is C_1-C_2-alkylene;
L is C_1-C_2-alkylene;
R^4 is methyl;
R^5 is C_1-C_4-alkyl substituted by -OR^6; and
R^6 is a C_3-C_{10}-carbocyclic group, preferably phenyl.

7. A compound according to claim 1, which is also a compound of formula XVI

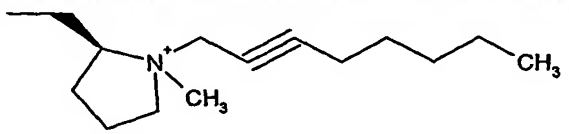
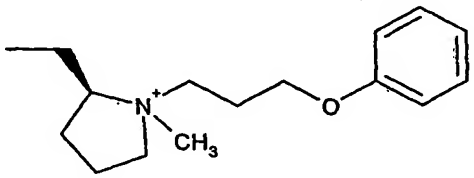
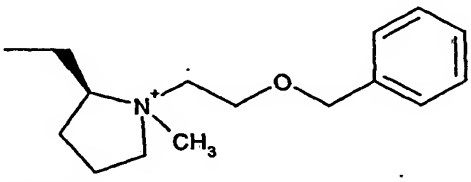
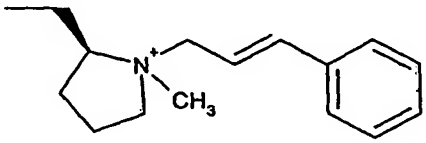
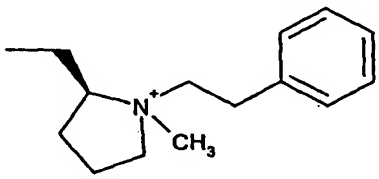
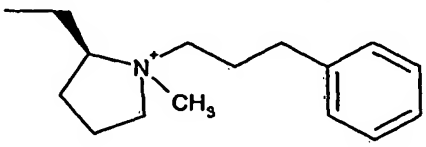


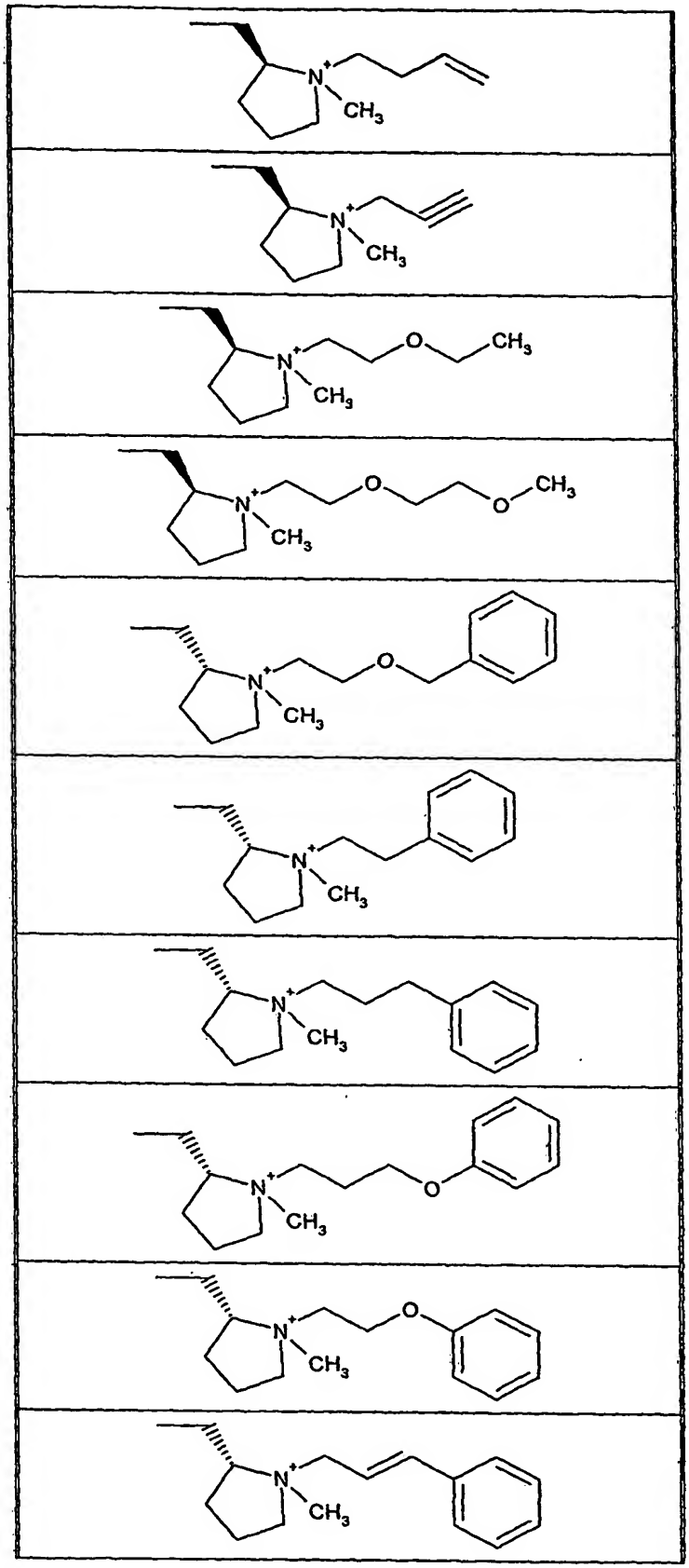
XVI

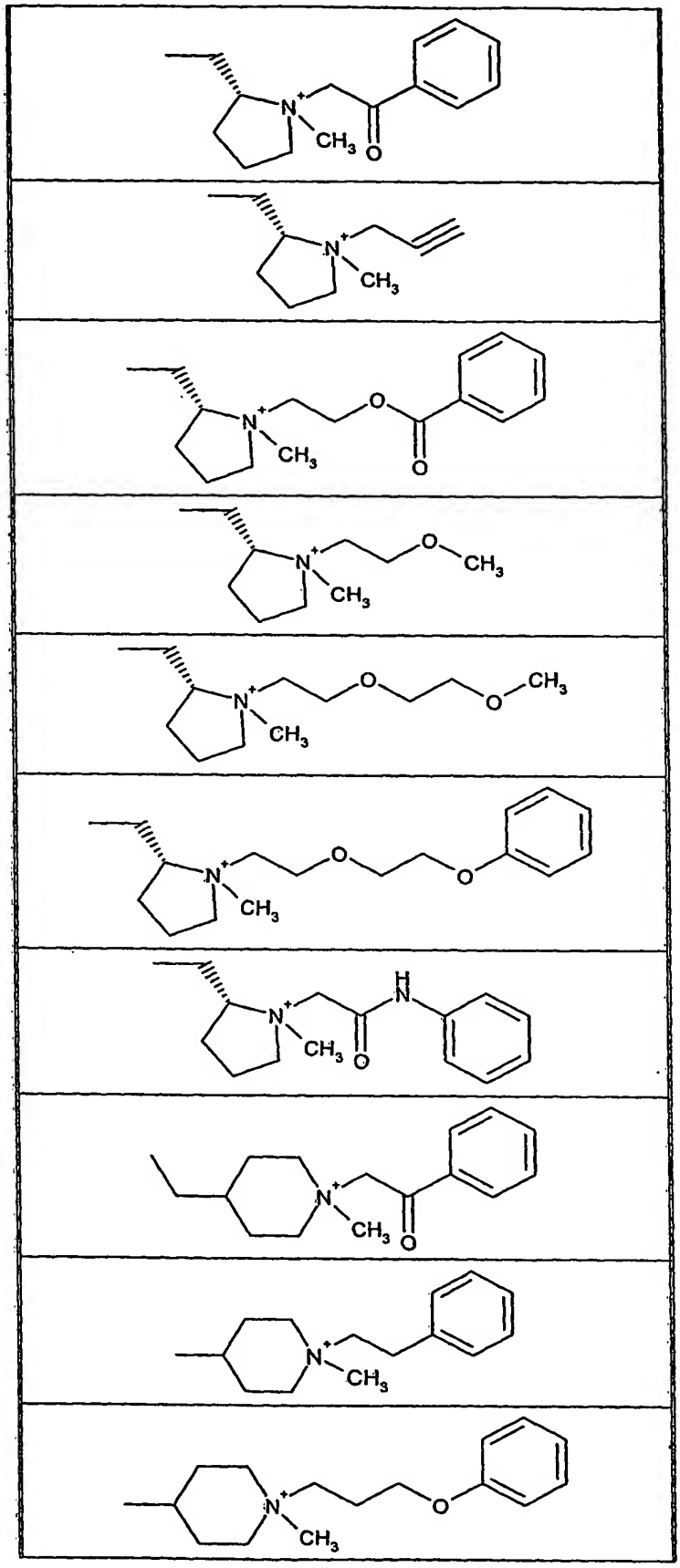
where T is as shown in the following table:

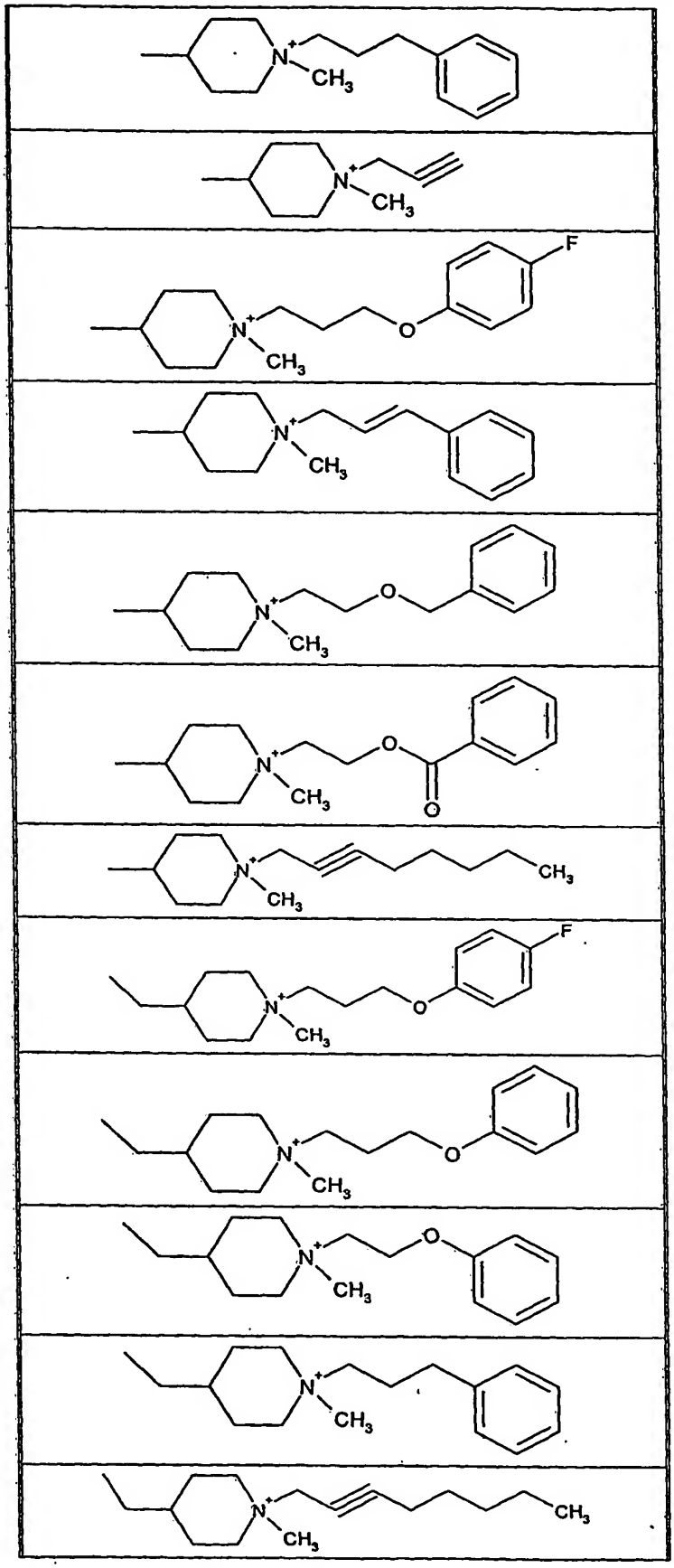
T



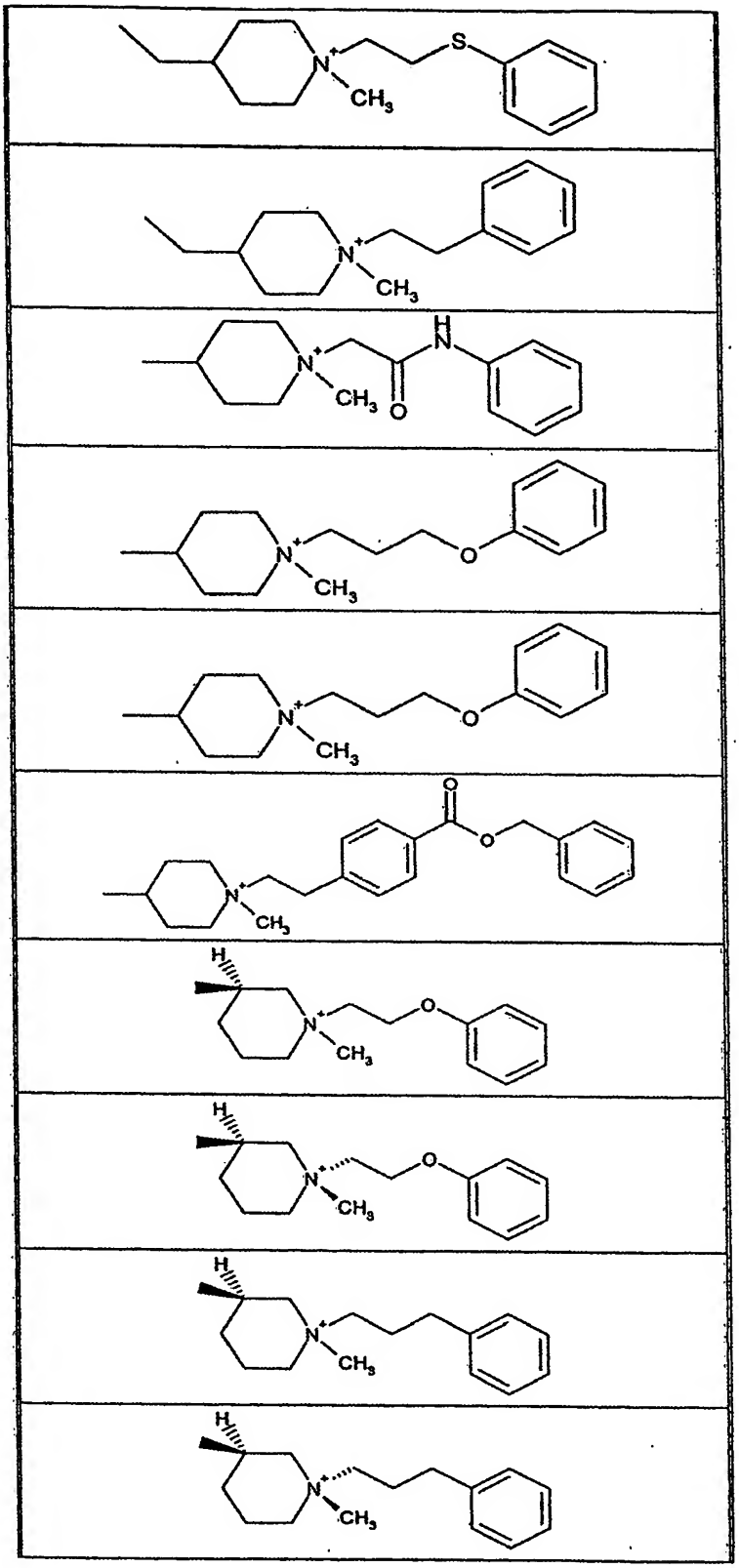
8. A compound according to claim 1, which is also a compound of formula XVI where T is as shown in the following table:

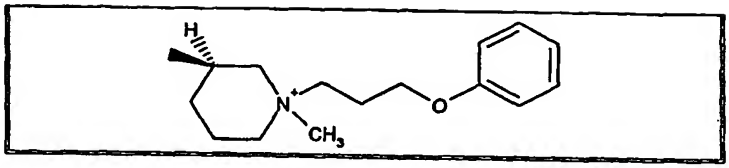
T









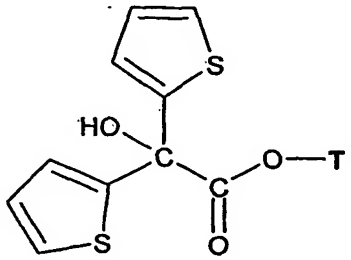






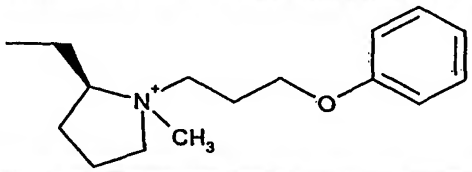
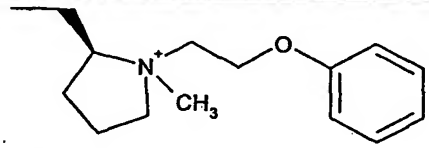
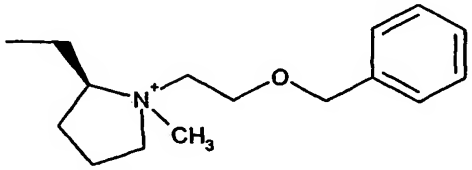
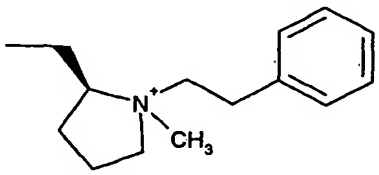
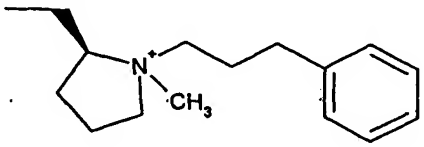


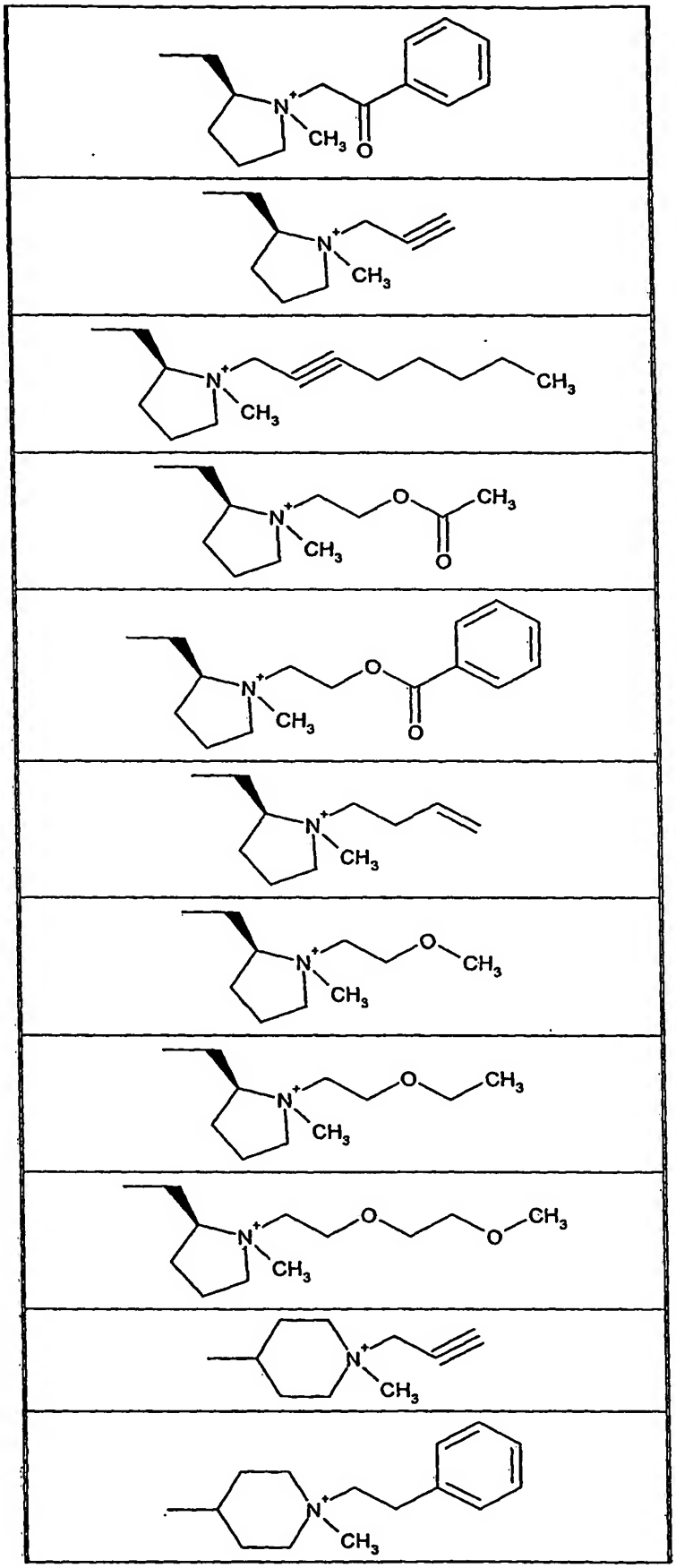
9. A compound according to claim 1, which is also a compound of formula XVII

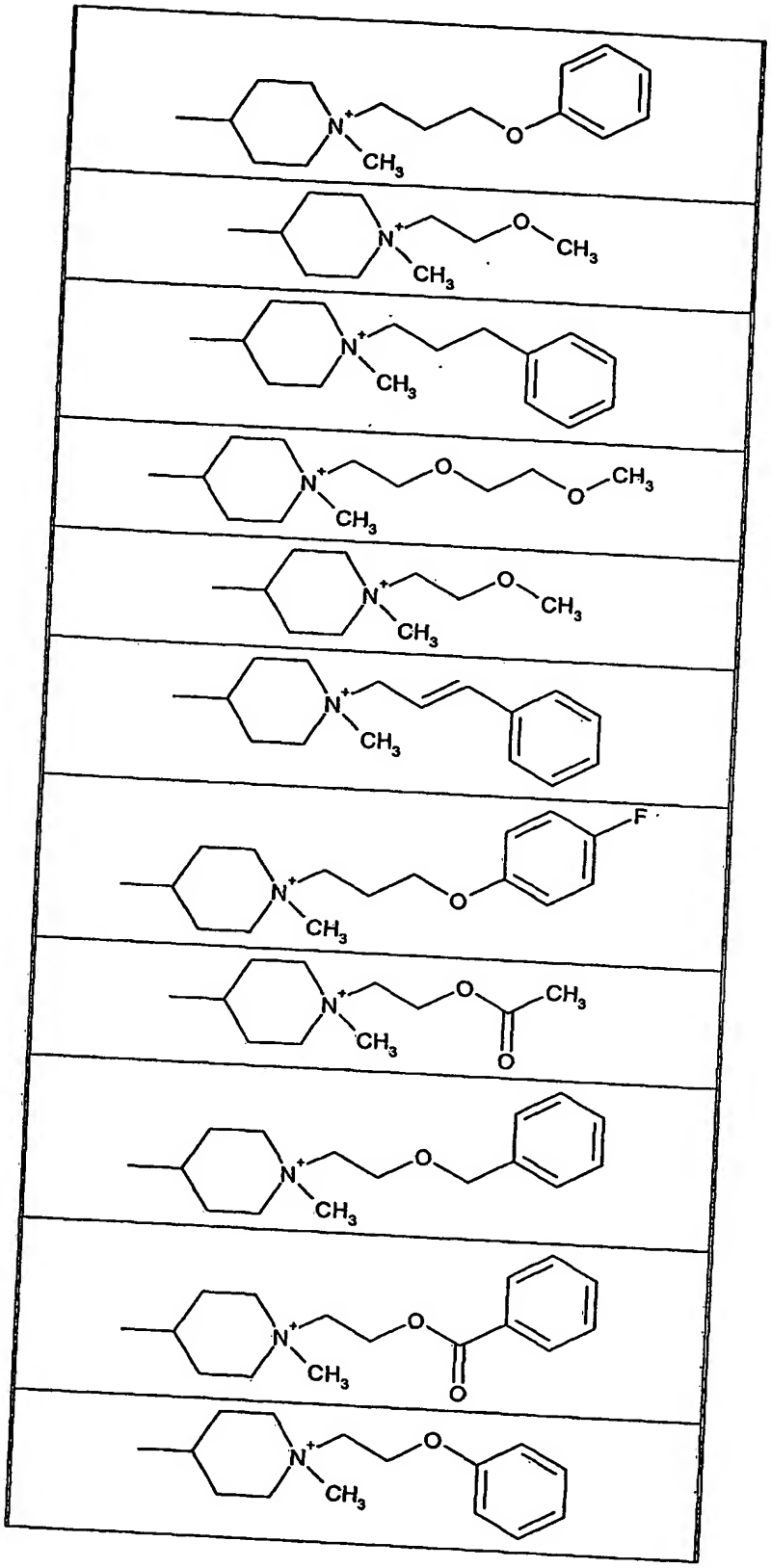


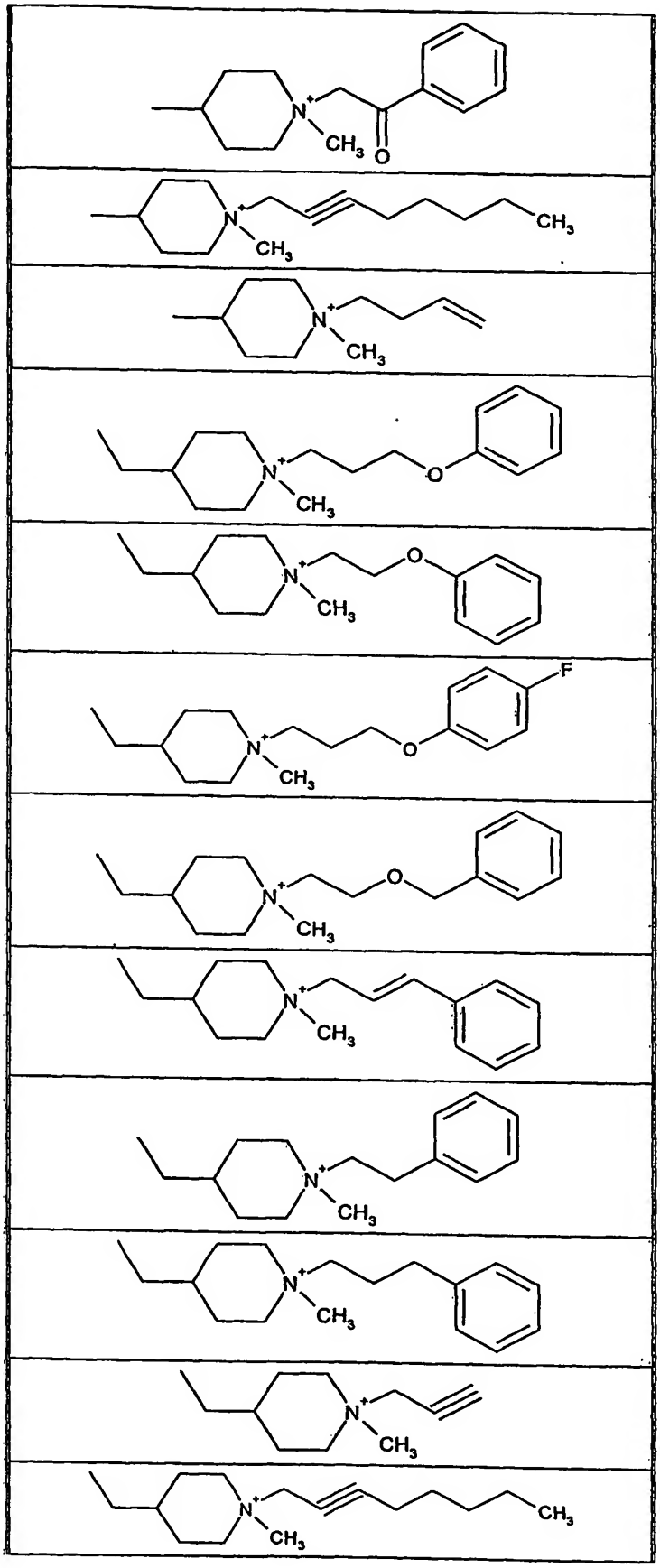
XVII

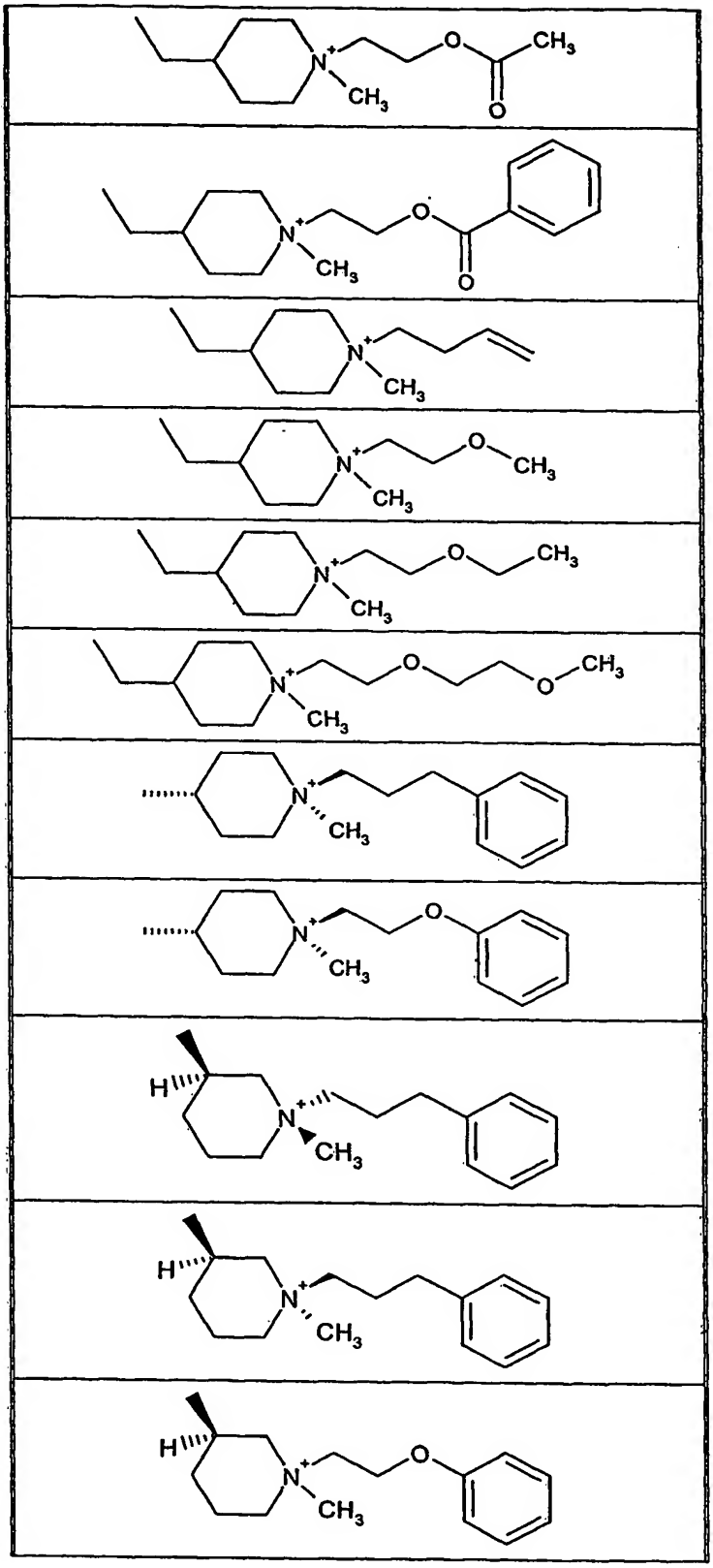
where T is as shown in the following table:

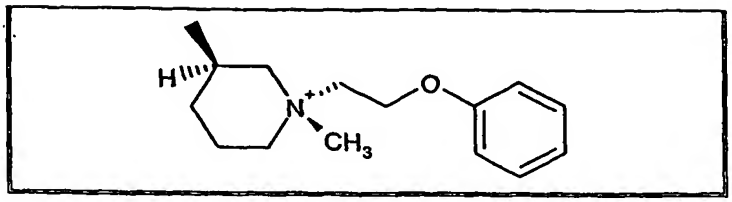
T
















10. A compound according to any one of the preceding claims in combination with at least one drug substance which is an anti-inflammatory, a bronchodilator, an antihistamine, a decongestant or an anti-tussive drug substance.

11. A compound according to any one of the preceding claims for use as a pharmaceutical.

12. A pharmaceutical composition comprising as active ingredient a compound according to any one of claims 1 to 10.

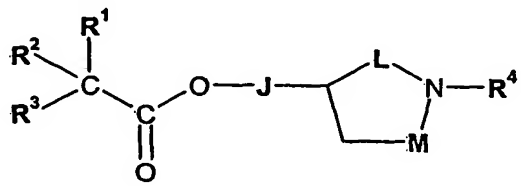
13. The use of a compound according to any one of claims 1 to 10 for the manufacture of a medicament for the treatment of a condition mediated by the muscarinic M3 receptor.

14. The use of a compound according to any one of claims 1 to 10 for the manufacture of a medicament for the treatment of an inflammatory or allergic condition, particularly an inflammatory or obstructive airways disease.

15. The use according to claim 13 or 14, in which the compound is a single enantiomer.

16. A process for the preparation of a compound of formula I as claimed in claim 1 which comprises:

(i) (A) reacting a compound of formula II



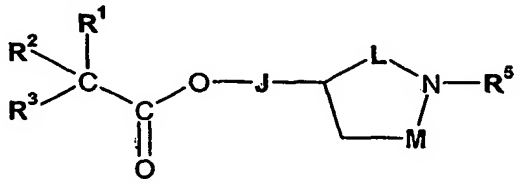
II

or a protected form thereof where R^1, R^2, R^3, R^4, J, L and M are as defined in claim 1, with a compound of formula III

III

where R^5 is as defined in claim 1 and X is chloro, bromo or iodo;

(B) reacting a compound of formula IV



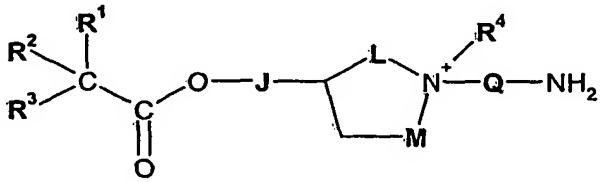
IV

or a protected form thereof where R^1, R^2, R^3, R^5, J, L and M are as defined in claim 1, with a compound of formula V

V

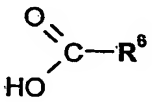
where R^4 is as defined in claim 1 and X is chloro, bromo or iodo;

(C) for the preparation of compounds of formula I where R^5 is -Q-NH-CO-R^6, reacting a compound of formula VI



VI

or a protected form thereof where R^1, R^2, R^3, R^4, J, L and M are as defined in claim 1 and Q is C_1-C_{10}-alkylene, with a compound of formula VII



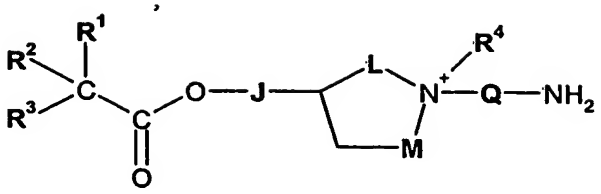
VII

or an amide-forming derivative thereof wherein R^6 is as defined in claim 1; or

(D) for the preparation of compounds of formula I where R^5 is C_1-C_{10}-alkyl substituted by a C_3-C_{15}-carbocyclic group that is substituted by carboxy, converting a compound of formula I where R^1, R^2, R^3, R^4, J, L and M are as defined in claim 1 and R^5 is C_1-C_{10}-alkyl substituted by a C_3-C_{15}-carbocyclic group that is substituted by either -COO-C_6-C_{10}-aryl or -COO-C_7-C_{15}-aralkyl; and

(ii) recovering the product in salt or zwitterionic form.

17. A compound of formula VI



VI

in salt or zwitterionic form wherein

R^1 and R^3 are each independently a C_3-C_{15}-carbocyclic group or a 5- to 12-membered heterocyclic group having at least one ring heteroatom selected from nitrogen, oxygen and sulphur;

R^2 is hydrogen, hydroxy, or C_1-C_4-alkyl optionally substituted by hydroxy;

L and M are (a bond and $-CH_2-CH_2-$), ($-CH_2-$ and $-CH_2-CH_2-$) or ($-CH_2-CH_2-$ and $-CH_2-$) respectively and J is C_1-C_2-alkylene,

or L and M are ($-CH_2-$ and $-CH_2-CH_2-$) or ($-CH_2-CH_2-$ and $-CH_2-$) respectively and J is a bond;

R^4 is C_1-C_4-alkyl; and

Q is C_1-C_{10}-alkylene.